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IMPORTANT TECHNICAL ACCOMPLISHMENTS IN LIGHT INDUSTRY DURING FIRST SIX MONTHS OF 1959

- COMMUNIST CHINA -

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IMPORTANT TECHNICAL ACCOMPLISHMENT IN LIGHT INDUSTRY DURING FIRST SIX MONTHS OF 1959

- COMMUNIST CHINA -

[Following is the translation of an article submitted by the Scientific Research-Design Institute, Light Industry Ministry, in Chung-kuo Ch'ing-kung-yeh (Chinese Light Industry), No. 19, Peiping, 13 October 1959, pp 27-28.]

Editor's Note: Following the continuous and penetrating execution of the general line and further development of the technical revolution movement, in the first half of this year, the whole country's light industry, in the midst of technical revolution and technical reform movement, has made obvious accomplishments. In order to propagate the principal accomplishments in the first six months of this year to various areas, this magazine takes the liberty to make selected introductions from the list of light industry achievements that have been collected, summarized, and compiled by the Scientific Research-Design Institute of the Ministry of Light Industry as follows:

1. 660,000-Volt Electric Cable Insulating Paper

To build the San-hsia Hydroelectric Power Station, high voltage electric cables were needed. For this, the Scientific Research-Design Institute of the Light Industry Ministry made a successful experiment by producing a 660,000-volt electric cable insulating paper from pulp. The electrical properties and physical strength of this insulating paper meet all requirements. The electrical properties' principal goals were that the medium's loss angle must be under 0.002, but it actually reached 0.00165 and 0.00185. After

this stage of experiment and study, the technical requirements for producing super-high voltage electric cable insulating paper were achieved for the first time.

2. Application of Coal Gas Ultra-Red Ray Drying Process in Paper-Making Industry

By utilizing the radioactive heat of the ultra-red ray, produced by the burning of coal gas on the heat-resisting brick surface of a concave round arc, paper and pulp can be dried readily. Ultra-red ray is a penetrating hot ray. Besides giving radioactive heat to the surface of the material so that the free moisture on the surface can be rapidly evaporated, it also sends heat into the interior of the material so that the moisture within it will be speedily driven out and dissipated. When the internal temperature has risen from 50°C to 1,000°C, the speed of dissipation rises as high as 7 times. Take the Hung-wen Paper Mill as an example, and compare it with the steam baking oven method:

(1) It saves 112 tons of steel, (2) it saves 245,000 yuan in investment. However, there still are weaknesses; the heat effect, for example, is not very high and it lacks safety measures. Study is now being made to seek a way to overcome these defects.

3. Soaking Sugar Cane For Producing Refined Sugar

The use of the native method of soaking sugar cane for the production of refined sugar, though it has a long history in this country, has actually gone through a very short study period. After this method was expanded by the 1958 on-the-spot meeting in Tung-hsiang Hsien, Kiangsi Province, Szechwan, Kiangsi, Fukien and Kwangtung provinces have made many experiments and attained preliminary results during the first six months of 1959. They have also made plans for 25-30 tons per day and 100 tons per day refined sugar production. In planning, with the hope of overcoming the weaknesses of great fuel consumption and the demand for a great amount of labor power, the 30 tons per day and 100 tons per day production have both adopted the wash-soaking and the soaking after steaming method at the same time as a production method. In the soaking process it makes use of cold water directly and does not use heating again. In regard to equipment, simple mechanized measures are used.

For instance, the soaking equipment for the 100-ton production plant uses the level trough chain-plate assembly line model, while those for the 30-ton production plant use the step ladder semi-assembly line model.

4. Assembly Line Production for Canned Green Beans

Previously, the Hai-lin Canned Goods Factory in Shanghai used partial mechanized equipment to produce canned green beans. Its labor productive rate was then low and its quality was inferior. After changing to automation, the labor productive rate raised greatly. From the process of breaking the pods to the grading of the beans, 22 workers have been taken out from each shift (37 workers have been reduced to 15 men). Besides this, after automation was adopted in the cooking, selecting, and canning processes, production output increased 3-4 times, and that in the freezing department rose to 30 times. Because of technical improvements, product quality has also been greatly raised. The finished products' nutritious elements, such as protein, increased from 3.48% to 3.98%, and sugar from 0.5% to 1.12%--all are higher than before. The taste of the finished products is fragrant and soft and their color is azure green.

5. Machine for Cracking Lichee Shells

Lichee is grown in South China in abundance. In the past, at harvest each year, because of the lack of appropriate processing facilities, a good part of the crop rotted. In August 1958 the Shanghai Food Planning Institute under the Light Industry Ministry, in collaboration with the Chang-chou Wine Brewery of Fukien Province, began a study to design a machine for cracking lichee shells. In June 1959 the machine for cracking lichee shells was given its first trial in Chang-chou, Fukien Province. Preliminary results show that each machine can crack 2,500 kilograms of lichee in one hour. The machine can either be hand operated or power operated. It saves much labor and raises production efficiency, so that lichee in the rush season can be timely processed into dried nuts, fruit juice, or wine. The requirement for canned lichee is higher; shelled lichee meat must be intact, and this requires a grading operation. At present, this machine has not entirely met this last requirement and it is necessary to study it further.

6. Assembly Line Production for Empty Cans

Empty can manufacturing in China has mostly been done by a semi-mechanized method. In order to raise efficiency and to lower labor exertion, some plants have begun to take some technical reform measures. The Lu-ta Can Factory, from feeding materials and cutting corners to welding, has adopted automation for the whole operation. In being applied to production, the method has the following special features:

(1) Tin plates of any thickness can be used.
(2) Cans of any size can be manufacture, and the machine can be dismantled easily.

7. Simple Mechanization Replaces Hand Operation in Pottery Industry

On the basis of the 1958 technical revolution and continuing the spirit of native method, the new technical experiences have been expanded, creating and improving mechanical equipment. From raw material development and processing to forming the mould (including brick preparation, brick making, and brick re-shaping), porcelain glazing, and design drawing, at every step there is simple, mechanized equipment to replace hand operation; thus, the labor production rate has been raised and labor exertion has been reduced.

For instance, because of the technical reform and the increase production economy movement, the Red Star Porcelain Plant in Ching-te-chen, Kiangsi, increased its degree of mechanization from 47% in 1958 to 91.89% in the first half of 1959. The Yu-chou Porcelain Plant in Kiangsi Province attained three technical revolutionary peaks, rendering its degree of increase in mechanization from 27% to 90% within one year's time. The Ping-chiang Hsien People's Commune in Hunan Province uses the water wheel as a source of power for the mechanized production of pottery.

8. Leather Industry Used Native Machinery

[This was discussed in the No. 15 issue of this magazine, so it is omitted here.]

9. Beautified Pig Skin and Its Industrial Uses

In order to improve the quality of pig skin, it is necessary to overcome two weaknesses, namely: the hardening part in the butt and pores which are too large. The Light

Industry Ministry established an experimental team in Shanghai for the purpose of beautifying pig skin. After a series of technical studies, certain achievements were attained. For instance, the leather quality in the cheeks and faces was improved and its stretch resistance increased. The degree of softness in the different parts of pig skin, such as in the butt and in the bellies, has reached a uniformity and can be used to make dress gloves. The elasticity of the finished products in either direction has reached 30%-40%. Pig skin now can be used to make leather rings for the textile factories in the spinning of 60 count cotton yarns. In the past these leather rings were made of calfskin; now pig skin can replace calfskin. In the past pig skin was thought to have too large pores to be of use in the making of skin rollers and oil filter rings, because of the oil leaking through the pores, but now, oil leaking has been stopped and pig skin has met all requirements.

Other experiments have been made, such as: embossing designs on the surface or making felt surface, printed and colored pig skin, white surface or white felt surface pig skin, and improved glandular surface pig skin. All these are now in production in Shanghai.

10. Top Fermentation for Beer Brewing

In order to shorten the fermentation time and to develop the productive potentiality of the beer breweries, the Scientific Research-Design Institute of the Light Industry Ministry experimented with the top fermentation method for beer brewing and the experiment was basically successful. Now, the Peiping Beer Brewery is using this method for production. During trial production, this brewery has creatively adopted a series of measures, such as utilizing the original ground equipment for top fermentation production, using slowly lowering temperature, and the long compressed temperature method to prevent fermentation from becoming turbid, so as to prevent filtering, and adding foam spirit to accelerate carbon dioxide saturation. Production began in June. In one month, 800 tons of raw beer were produced, of which 600 tons were sold. Until now, there has been no unfavorable reaction. The merits of top fermentation are: (1) fermentation temperature is higher (15-17°C), it avoids the trouble of building technically complicated freezing equipment, and it is suitable for medium and small cities; (2) short fermentation time, generally 10-15 days, the shortest needing only 7 days (bottom fermentation fresh beer

production cycle is more than 50 days), increases the equipment production capacity rate 3-5 times, and lowers production cost by 11.96%. The remaining problem is that the beer contains insufficient carbon dioxide, which renders the beer a taste of yeast.

11. Preliminary Study of Artificial Ripening in Grape Wine

The principal purpose of the artificial method is hastening the ripening of grape wine is to shorten the raw wine's storage time, so that grape wine may ripen earlier and be made into drinking wine sooner, thereby satisfying the consumers' great demand. The principal measures used in the present experiment are freezing, oxidization, and heat treatment, and adjusting the ingredients. By these methods, the ripening of grape wine is hastened, and the storage time is expected to be shortened from two years to six months. Now the Peiping Brewery has begun production. Samples have been tested. The artificially tempered wine, from the standpoints of color, fragrance and taste, and of physical and chemical requirements, has met the various standards.

12. Rice Stalk Fermentation to Produce Pulp

The Szechwan Pulp Research Institute used black mold and green mold, together with the water used in washing rice, to conduct rice stalk fermentation. The paper made from the fermentation produced by the above mentioned three methods, as compared with the paper made from non-fermented pulp, has a lighter and more beautiful appearance, with fine texture and no black spots nor rough tissues produced by the knots of the rice stalks. The mold used in the experiment are those that can be cultivated easily, while the rice washing water is a common and simple matter.

13. Dried Sweet Potato Solid Body Fermentation Method to Produce Citric Acid

The Fermentation Study Unit of the Scientific Research Design Institute of the Light Industry Ministry in cooperation with the Shanghai Chung-hsi Pharmaceutical Plant and other units, from September to the end of November in 1958 studied

the use of the sweet potato solid body fermentation method to produce citric acid, and they completed a small scale trial production. Now the Shanghai Chung-hsi Pharmaceutical Plant is producing this product. One chin of citric acid crystal can be obtained from eight chin of sweet potatoes; its quality has met international pharmaceutical standards; and its present production cost is 2.75 yuan per chin.

This method makes use of the original fermentation equipment in the white wine brewery for production. Its production technique is simple and its operation requirements are similar to those in the production of yeast; thus, this method can be easily adopted. Fermentation time is about 72 hours, and it can be easily controlled. It requires only simple equipment, which is shallow liquid trays. This is an advantage that cannot be found in the deep fermentation method. Of course, there still are weaknesses in this method, such as hand operation, too much labor required, and taking up too much plant space. These problems require further study before they can be solved.

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